

CLAIMS

What is claimed is:

1. A plasma processing reactor comprising:
a chamber having a removable substrate support which is not axially symmetric about a vertical axis of said chamber;
a RF power supply coupled to said chamber, said RF power supply adapted to supply RF power to the interior of said chamber and thereby create a plasma therein;
a coating of a film selectively applied prior to a processing to a portion of a surface of an inner sidewall of said chamber, said coating including an electrically resistive material having an RF impedance substantially different from an underlying base material of said chamber.
2. The plasma processing reactor of claim 1 wherein said film is applied with varying composition around said inner sidewall of said chamber so as to vary the RF impedance azimuthally.
3. The plasma processing reactor of claim 1 wherein said film is applied with varying thickness around said inner sidewall of said chamber so as to vary the RF impedance azimuthally.
4. The plasma processing reactor of claim 1 wherein said film is in various shapes providing partial coverage around said inner sidewall of said chamber so as to vary the RF impedance azimuthally.

5. The plasma processing reactor of claim 1 wherein said coating includes a plurality of film strips which thickness varies along said portion of said surface of said sidewall and along said substrate support.
6. The plasma processing reactor of claim 1 wherein said coating includes a plurality of film strips azimuthally positioned.
7. The plasma processing reactor of claim 1 further comprising said coating of said film selectively applied prior to said processing to a portion of a surface of said removable substrate support within said chamber.
8. The plasma processing reactor of claim 1 wherein said electrically resistive material includes Nickel.
9. The plasma processing reactor of claim 1 wherein said electrically resistive material includes Copper.
10. The plasma processing reactor of claim 1 wherein said coating is plated to said portion of said surface of said inner sidewall of said chamber.
11. A plasma processing reactor comprising:

a chamber including an opening extending through an inner sidewall of said chamber;

a substrate support removably mounted therein, said opening large enough to allow said substrate support to be removed from said chamber through said opening;

a coating of a plurality of film strips applied to a portion of a surface of said inner sidewall and said substrate support within said chamber, said coating including an electrically resistive material having an RF impedance substantially different from the underlying base material of said chamber.

12. A method for balancing return currents in a plasma processing reactor having a chamber including an opening extending through an inner sidewall of said chamber, a substrate support removably mounted therein, the opening large enough to allow the substrate support to be removed from the chamber through the opening, the method comprising:

selectively applying a coating of a film to a portion of a surface of the inner walls of said chamber, said coating including an electrically resistive material having an RF impedance substantially different from an underlying base material of said chamber.

13. The method of claim 12 further comprising selectively applying said coating of said film to a portion of a surface of the substrate support within said chamber.

14. The method of claim 12 wherein said applying said coating of said film further comprises plating said coating of said film.

15. The method of claim 12 wherein said coating has a variable thickness.
16. The method of claim 12 wherein said electrically resistive material includes Nickel.
17. The method of claim 12 wherein said electrically resistive material includes Copper.
18. The method of claim 12 wherein said coating includes a plurality of film strips.
19. The method of claim 12 further comprising positioning said plurality of film strips vertically.
20. The method of claim 12 further comprising positioning said plurality of film strips horizontally.